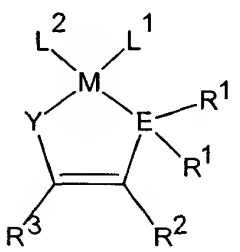
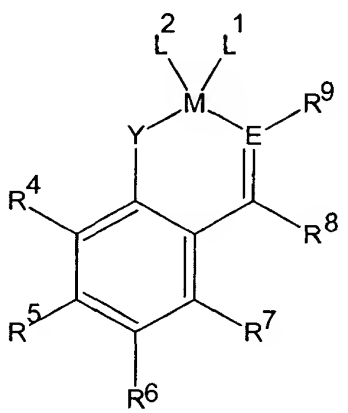
COPY OF ALL CLAIMS

1. Process for the production of aqueous polymer dispersions by the reaction of one or more olefinically unsaturated compounds in aqueous medium in the presence of

a1) a complex compound of the general formula Ia and/or Ib



Ia



Ib

in which the substituents and indices have the following meaning:

M a transition metal of groups 7 to 10 of the periodic system of the elements,

L phosphanes $(R^{16})_xPH_{3-x}$ or amine $(R^{16})_xNH_{3-x}$ having identical or different substituents R^{16}, ethers $(R^{16})_2O$, H_2O, alcohols $(R^{16})OH$, pyridine, pyridine derivatives of the formula $C_5H_{5-x}(R^{16})_xN$, CO, C_1C_{12} alkyl nitriles, C_6C_{14} aryl nitriles or ethylenically unsaturated double-bonded systems, x standing for an integer between 0 and 3,

L^2 halide ions, amide ions $(R^{16})_hNH_{2-h}$, h standing for an integer between 0 and 2, and furthermore C_1-C_6-alkyl anions, allyl anions, benzyl anions or aryl anions, wherein L^1 and L^2 can be linked to one another by means of one or more covalent bonds,

E nitrogen,

Y oxygen, sulfur, N-R^{10} or P-R^{10},

R^1 hydrogen, C_1-C_{12}-alkyl groups, C_7-C_{13}aralkyl substitutents or C_6-C_{14} aryl groups,

R^2,R^3 independently of one another

hydrogen,

C_1-C_{12} alkyl, wherein the alkyl groups can be branched or unbranched,

C_1-C_{12} alkyl, singly or multiply substituted by identical or different C_1-C_{12} alkyl groups, halogens, C_1-C_{12} alkoxy groups or C_1-C_{12} thioether groups,

C_7-C_{13} aralkyl,

C_3-C_{12} cycloalkyl,

C_3-C_{12} cycloalkyl, singly or multiply substituted by identical or different C_1-C_{12} alkyl groups, halogens, C_1-C_{12} alkoxy groups or C_1-C_{12} thioether groups,

C_6-C_{14} aryl,

C_6-C_{14} aryl, identically or differently substitued by one or more C_1-C_{12} alkyl groups, halogens, singly or multiply halogenated C_1-C_{12} alkyl groups, C_1-C_{12} alkoxy groups, silyloxy groups $OSiR^{11}R^{12}R^{13}$, amino groups $NR^{14}R^{15}$ or C_1-C_{12} thioether groups,

C_1-C_{12} alkoxy groups,

silyloxy groups $OSiR^{11}R^{12}R^{13}$,

halogens or

amino groups $NR^{14}R^{15}$

wherein the substituents R^2 and R^3 can form a saturated or unsaturated 5- to 8-membered ring with one another,

R^4 to R^7 independently of one another

hydrogen,

C_1-C_{12} alkyl, wherein the alkyl groups can be branched or unbranched,

C_1-C_{12} alkyl, singly or multiply substituted by identical or different C_1-C_{12} alkyl groups, halogens, C_1-C_{12} alkoxy groups or C_1-C_{12} thioether groups,

C_7-C_{13} aralkyl

C_3-C_{12} cycloalkyl,

C_3-C_{12} cycloalkyl, singly or multiply substituted by identical or different C_1-C_{12} alkyl groups, halogens, C_1-C_{12} alkoxy groups or C_1-C_{12} thioether groups,

C_6-C_{14} aryl,

C_6-C_{14} aryl, identically or differently substituted by one or more C_1-C_{12} alkyl groups, halogens, singly or multiply halogenated C_1-C_{12} alkyl groups, C_1-C_{12} alkoxy groups, silyloxy groups $OSiR^{11}R^{12}R^{13}$, amino groups $NR^{14}R^{15}$ or C_1-C_{12} thioether groups,

C_1-C_{12} alkoxy groups

silyloxy groups $OSiR^{11}R^{12}R^{13}$,

halogens

NO_2 groups or

amino groups $NR^{14}R^{15}$,

wherein pairs of neighboring substitutents R^4 to R^7 can form a saturated or unsaturated 5- to 8-membered ring with one another,

R^8,R^9 independently of one another

hydrogen,

C_1-C_6 alkyl groups,

C_7-C_{13} aralkyl substituetnts or

C_6-C_{14} aryl groups, optionally substituted by one or more C_1-C_{12} alkyl groups, halogens, singly or multiply halogenated C_1-C_{12} alkyl, C_1-C_{12} alkoxy groups, silyloxy groups $OSiR^{11}R^{12}R^{13}$, amino groups $NR^{14}R^{15}$ or C_1-C_{12} thioether groups,

R^{10} to R^{15} independently of one another

hydrogen,

C_1-C_{20} alkyl groups, which on their part may be substitued by $O(C_1$-C_6 alkyl) or $N(C_1$-C_6 alkyl)$_2$ groups,

C_3-C_{12} cycloalkyl groups,

C_7-C_{13} aralkyl substitutents or C_6-C_{14} aryl groups

R^{16} hydrogen,

C_1-C_{20} alkyl groups, which for their part may be substituted by $O(C_1$-C_6 alkyl) or $N(C_1$-C_6 alkyl)$_2$ groups,

C_3-C_{12} cycloalkyl groups,

C_7-C_{13} aralkyl substitutents or C_6-C_{14} aryl groups,

b) dispersing agents and optionally

c) organic solvents having low solubility in water,

d) the metal complexes a1) being dissolved in a portion or the total quantity of the olefinically unsaturated compounds and/or of the organic solvents c) having low solubility in water and

e) the portion or the total quantity of the olefinically unsaturated compounds and/or of the organic solvents c) having low solubility in water which holds the metal complexes a1) in solution being present in the aqueous medium as a dispersed phase having an average droplet diameter ≤ 1,000 nm.

2. Process as claimed in claim 1, wherein the metal complex a1) is used in combination with an activator a2).

3. Process as claimed in claim 1, wherein an electrically neutral nickel complex compound is used as the complex compound of the general formula I a and/or I b.

4. Process as claimed in claim 2, wherein the activator a2) is an olefin complex of rhodium or nickel.

5. Process as claimed in claim 1, wherein ethylene is used exclusively as olefin.

6. Process as claimed in claim 1, wherein at least two olefins selected from the group comprising ethylene, propylene, 1-butene, 1-hexene and styrene are used.

8. Process as claimed in claim 1, where anionic, cationic and/or nonionic emulsifiers are employed as the dispersing agents b).

9. Process as claimed in claim 1, wherein aliphatic and aromatic hydrocarbons, fatty alcohols and/or fatty acid esters are used as the organic solvents c).

10. Process as claimed in claim 1, wherein the portion or the total quantity of the olefinically unsaturated compounds and/or of the organic solvents c) having low solubility in water which contains the metal complexes a1) in solution and which is present in the aqueous medium as a disperse phase having an average droplet diameter $\leq$ 1,000 nm contains further components.

11. Aqueous polymer dispersion prepared by a process as claimed in claim 1

12. Use of an aqueous copolymer dispersion as claimed in claim 11 as binding agent in adhesives, sealing compounds, plastic plasters and surface coatings.